



Staff memo

Investor behaviour in Swedish bond markets

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May 2024

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Staff memos

A staff memo provides members of the Riksbank's staff with the opportunity to publish advanced analyses of relevant issues. It is a publication for civil servants that is free of policy conclusions and individual standpoints on current policy issues. Publication is approved by the appropriate Head of Department. The opinions expressed in staff memos are those of the authors and should not be regarded as the Riksbank's standpoint.

Summary

Investor behaviour can affect the functioning of markets and create risks. In this staff memo, I use microdata on almost 5,000 bonds to examine how investor behaviour has changed over time and varied depending on market situations. Since 2020, situations such as the initial market effects of the coronavirus pandemic, the Riksbank's quantitative easing and tightening measures, and shifting interest rates and risk premia have affected investor behaviour in Swedish bond markets.

For example, I find that the Swedish insurance and pension sector, together with banks, acted countercyclically in the corporate bond market during the first quarter of the pandemic. They bought two-thirds of the corporate bonds that funds with liquidity problems sold in the market. Additionally, the insurance and pension sector was the biggest buyer in the issuances after the worst of the turmoil. In contrast, they acted procyclically in covered bonds, when banks periodically struggled to issue such bonds. This procyclical behaviour was paused when the Riksbank started buying covered bonds and resumed when the Riksbank started letting its holdings mature, and risk premia rose again.

The markets have so far absorbed the Riksbank's quantitative tightening measures, and foreign investors are returning to Swedish bond markets at roughly the same rate as they left during the period of quantitative easing. Some of these foreign investors are funds, and there are indications that they have leveraged part of their holdings of covered bonds, which can make banks' market funding more volatile. For corporate bonds, flow-driven funds may have kept risk premia subdued, contributing to easier funding conditions but also creating vulnerabilities. At the same time, long-term private insurance and pension companies have been countercyclical, mainly buying at elevated risk premia.

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¹ I would like to thank Erik O Andersson, Caroline Jungner, Anders Kvist, Jonas Niemeyer, Olof Sandstedt, Ulf Stejmar, Johanna Stenkula von Rosen and Stephan Wollert for valuable comments on various drafts. Thanks also to Daniel Hansson and the Riksbank's Statistics Division, as well as Gary Watson for help with the translation of the publication, and the seminar participants for their wise comments.

1 Introduction

Swedish bond markets need to function well and there needs to be sufficient liquidity in them for different market participants to be able to fund themselves, manage risks and earn returns to cover their commitments.² They are a pillar of financial stability and the efficient transfer of capital from investors to borrowers, also known as issuers.³ In times of stress, deteriorating market conditions can pose a risk to financial stability if issuers face difficulties in funding their important activities, such as banks' mortgage lending to households. How well the markets function depends in part on the conditions under which the participants operate and how they behave.

In March 2020, the Riksbank increased its bond purchases as a monetary policy measure to curb the negative impact of the coronavirus pandemic on the Swedish economy. Since the second quarter of 2022, the Riksbank has allowed bonds to mature, and in April 2023 the Riksbank also started selling government bonds. These measures have taken place during periods of market turmoil, shifting interest rates and risk premia. This creates an opportunity to examine how these market situations have affected investor behaviour in Swedish bond markets.

These bond markets are important funding markets for the Swedish government, municipalities, banks and non-financial companies. The participants in them can be divided into issuers, market makers and investors.⁴ I also discuss the foreign currency bond borrowing of Swedish issuers in international markets, which is a financing option for many of them.

The Riksbank, among others, has previously focused on identifying vulnerable investors that could negatively affect markets if they need to make large sell-offs of bonds to obtain liquidity. They may then act procyclically, i.e. they sell even though prices are falling, further fuelling the price decline. One example is corporate bond funds, which invest in relatively illiquid bonds while offering their unit-holders the possibility of daily redemptions. If many people try to withdraw their money at the same time, for example during the coronavirus pandemic, this can lead to a fall in bond prices and a rapid rise in interest rates, which increases the cost for companies to obtain funding in the market. The liquidity crisis in UK pension funds in autumn 2022 and the turbulence in the US and UK government securities markets, among others, in March 2020 are other examples of when sell-offs have contributed to problems in the markets.⁵

To complement this analysis, we can identify those investors who instead have the ability to act countercyclically in such situations, i.e. they buy when prices fall because they find them attractive. Such behaviour may in turn alleviate price falls and the

² Defining the functioning of a bond market is difficult. But it relates to how efficient the market is at matching buyers and sellers and setting prices for transactions. The exchange of information and transparency about what other parties have agreed on also plays a role. In addition, there are quantitative indicators that measure the functioning of and liquidity in the market, see for example Crosta and Zhang (2020).

³ A bond is a debt instrument that certifies that the holder has lent money to the issuer. When the loan expires, the issuer must pay it back with interest. Bonds are issued with maturities of at least one year.

⁴ The activity of the market maker is to quote both bid and ask prices in bonds and thereby be prepared to both sell and buy them.

⁵ See Andersson (2023) and Schrimpf, et al. (2020).

funding costs for companies in strained funding environments. However, investors do not act procyclically or countercyclically in all market situations, or on all markets. Therefore, it is important to examine their behavioural patterns both under normal market conditions and during periods of increased financial stress.

Furthermore, it is important to highlight the incentive, and to some extent the ability, of the investor community to buy the bonds issued by the issuers to replace the Riksbank's maturing bond holdings. This becomes particularly relevant if the issuers simultaneously face an increased borrowing need and thus need to increase their supply of bonds. It is also important to highlight who those investors are. Some of them may be more vulnerable or volatile than others and could thus make participants' funding more volatile or adversely affect the market functioning in the event of future shocks.

I therefore analyse the investors' holdings of all bonds at face value issued by Swedish issuers. This covers almost 5,000 different bonds in various currencies.⁶ I divide the analysis into two periods: the first quarter of the coronavirus pandemic and over time, spanning from Q4 2018 to Q1 2024. These periods complement each other by highlighting behaviour both during the initial market turmoil arising from the pandemic and over a five-year period of quantitative easing and tightening by the Riksbank, as well as shifting interest rate levels and risk premia.

Although I touch on four types of bonds, I mainly focus in both periods on banks' covered bonds and bonds issued by non-financial companies.⁷ Firstly, however, I will give an overview of all bond types. This is because they are interlinked with each other, especially government bonds, covered bonds and municipal bonds issued by Kommuninvest. Investors often consider these as substitutes for each other as they can largely serve as substitutes due to their low credit risk and relative ease of tradability. However, the slight differences in credit risk and liquidity mean that covered bonds and municipal bonds typically carry slightly higher yields than government bonds with the same maturity.⁸

⁶ I use the securities holdings database (VINN) and the Swedish securities database (SVDB).

⁷ A covered bond means that the holder has a priority right to a certain type of collateral in the event of bankruptcy. The main assets underlying Swedish covered bonds are households' mortgages.

⁸ See Financial Stability Council (2023). They are also recognised as collateral for banks' loans at the Riksbank,

2 Investors' holdings in growing bond markets

In this section, I illustrate the holdings of various investors—both domestic and foreign—across four Swedish bond markets, as well as their holdings of bonds in foreign currency (FX) issued by Swedish issuers. Furthermore, I highlight some structural changes that have affected the investors' market shares in recent years and that are relevant to the analysis in this staff memo.

Bonds are a significant and important source of funding for issuers

At the end of March 2023, total Swedish liabilities in debt securities amounted to more than SEK 9.7 trillion, equivalent to almost 155 per cent of Sweden's GDP. Most of this debt—almost four-fifths—consisted of bonds and the rest of money market instruments. The largest components of this debt consist, in descending order, of: covered bonds issued by banks, non-covered bonds issued by financial companies and banks, government bonds, corporate bonds issued by non-financial companies, municipal bonds (including bonds issued by Kommuninvest) and bonds issued by other financial companies.⁹

Covered bonds are important for banks, which use them to fund a significant share of household mortgages. Government bonds are necessary not only to cover the government's borrowing needs but also for the pricing of other, riskier, bonds. Corporate bonds account for a large share of total borrowing by non-financial companies and serve as an essential complement to bank loans, and municipal bonds are crucial for municipal and regional financing.

The Riksbank's ownership affects the tradable volume of bonds

By owning bonds, the central bank reduces the amount of bonds available for trading, which is known as free float. This means that if the Riksbank buys a bond from one participant, the other participants' shares of the free float increase. This reduces the amount of bonds that investors can trade in the market. Conversely, if the Riksbank sells a bond or allows it to mature, and the issuer then issues a new bond that is bought by another participant, their shares decrease.

The Riksbank bought several types of bonds

Starting in February 2015, the Riksbank purchased government bonds with the aim of making monetary policy more expansionary. At the outbreak of the coronavirus pandemic, the Riksbank already had significant holdings of government bonds (see Chart 1, left) To mitigate the effects of the pandemic on the Swedish economy, the Riksbank

⁹ See [Increased borrowing in debt securities \(scb.se\)](https://www.scb.se/en/press-releases/2023/03/increased-borrowing-in-debt-securities).

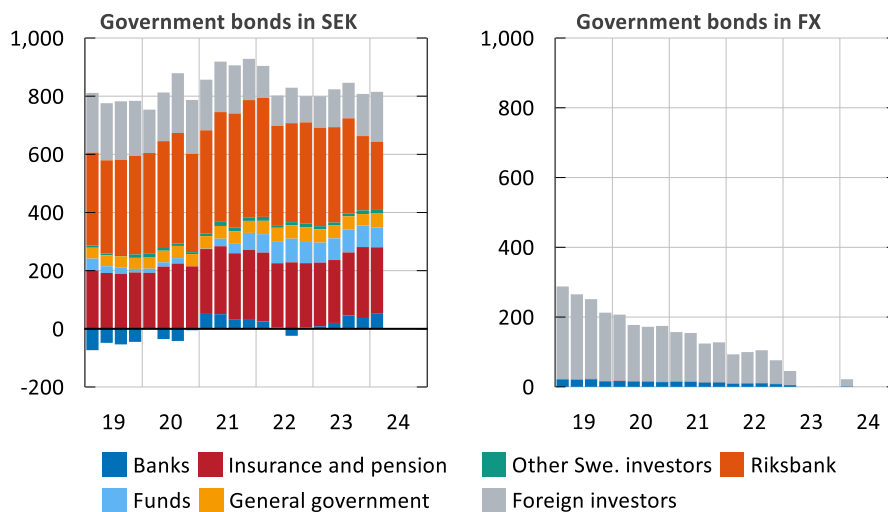
increased its asset purchases from March 2020 until 31 December 2021 with a total envelope of SEK 700 billion, in addition to the purchases planned prior to the pandemic.¹⁰ These purchases came to include—in addition to government bonds—covered bonds, municipal bonds, commercial paper, treasury bills and corporate bonds. Excluding the Riksbank's purchases of treasury bills and commercial paper, purchases consisted of 67 per cent covered bonds, 17 per cent municipal bonds, 14 per cent government bonds and 2 per cent corporate bonds. In 2022, the purchases were made to compensate for maturing bonds, and in April 2022 the Executive Board decided to reduce the rate of purchases to gradually start reducing the Riksbank's holdings. From 2023 onwards, no further purchases were made, and in April 2023 the Riksbank started selling government bonds instead.

The composition of investors in Swedish bonds has changed

In addition to the Riksbank, the insurance and pension sector—which includes the national pension funds (AP funds)—and foreign investors of various kinds, are major players in the Swedish **government bond** market. More recently, funds have also become a bigger part of the market. It is worth noting that the government's bond borrowing in Swedish kronor has been relatively constant over the past five years.

Chart 1. Investors' holdings of Swedish government bonds

SEK billion



Note. Banks refer to monetary financial institutions such as banks, credit market companies. Insurance and pension include the national pension funds (AP funds). Negative values in the chart on the left for government bonds mean that the investor group has net sold borrowed bonds with the aim of buying them back in the future.

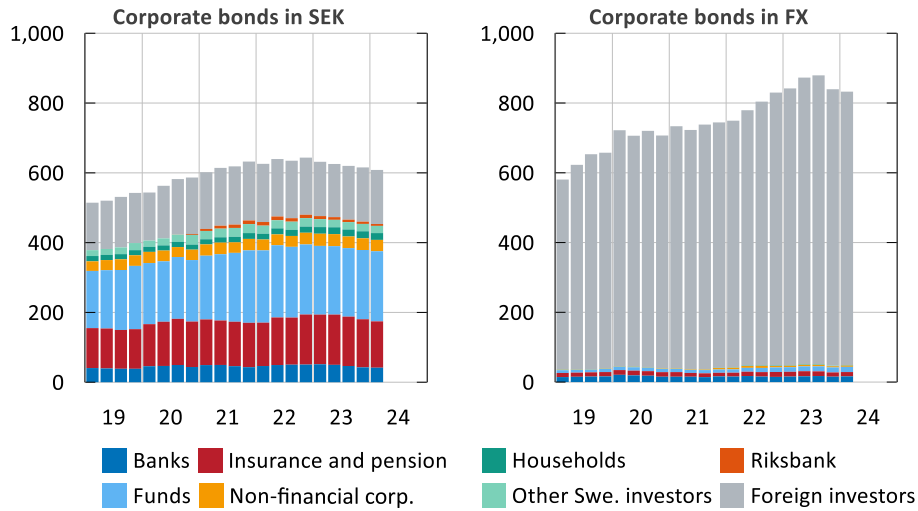
Sources: Statistics Sweden and the Riksbank

On the right-hand side of Chart 1, we can see that the government's bond borrowing in foreign currency has decreased significantly. This is partly due to the fact that in

¹⁰ For a detailed review of the Riksbank's purchases of securities 2015-2022, see Andersson et al. (2022).

Chart 3. Investors' holdings of corporate bonds

SEK billion



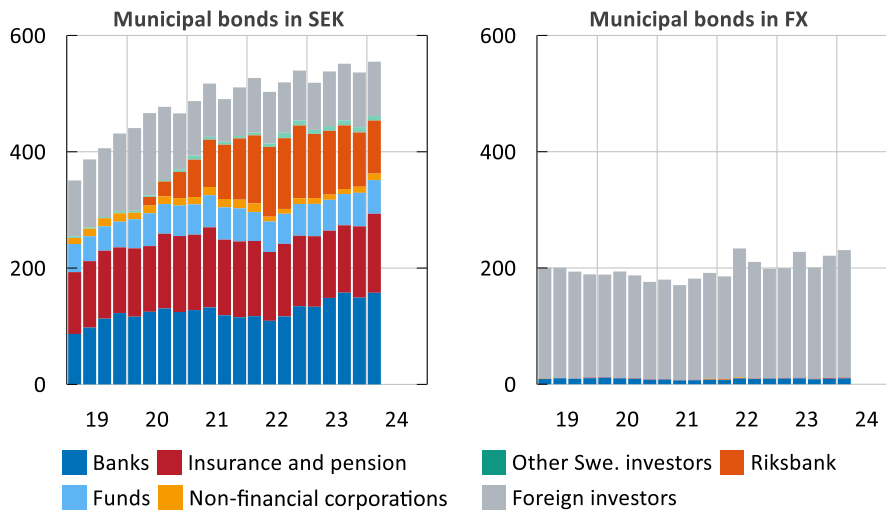
Note. Banks refer to monetary financial institutions such as banks, credit market companies. Insurance and pension include the national pension funds (AP funds).

Sources: Statistics Sweden and the Riksbank

Apart from foreign investors, Swedish banks are the largest holders of **municipal bonds**, including bonds issued by Kommuninvest—which are largely in foreign currency (see Chart 4). Also in this Swedish bond market, the insurance and pension sector is a significant owner, along with funds and the Riksbank.

Chart 4. Investors' holdings of municipal bonds

SEK billion



Note. Includes bonds issued by Kommuninvest. Banks refer to monetary financial institutions such as banks, credit market companies. Insurance and pension include the national pension funds (AP funds).

Sources: Statistics Sweden and the Riksbank

3 Investor behaviour during the first quarter of the coronavirus pandemic

In the first quarter of 2020, corporate bond funds experienced large outflows, which created significant selling pressure and contributed to the stress in the corporate bond market. I estimate that the Swedish insurance and pension sector, together with banks, bought two-thirds of the corporate bonds that funds sold in the secondary market. Additionally, the insurance and pension sector was the biggest buyer in the issues after the worst of the turmoil. In contrast, they acted procyclically in covered bonds, selling significantly more than funds. Funds initially sold covered bonds, as they were easier to dispose of than their corporate bonds in the current market environment, but then bought them back at the end of the quarter when the worst of the turmoil had subsided.

In order to get a complete picture of the turbulence that arose in the markets due to the outbreak of the coronavirus pandemic, I analyse transactions in all Swedish bonds, but with a particular focus on corporate bonds and covered bonds as these markets were affected the most.

3.1 The coronavirus pandemic created turbulence in financial markets

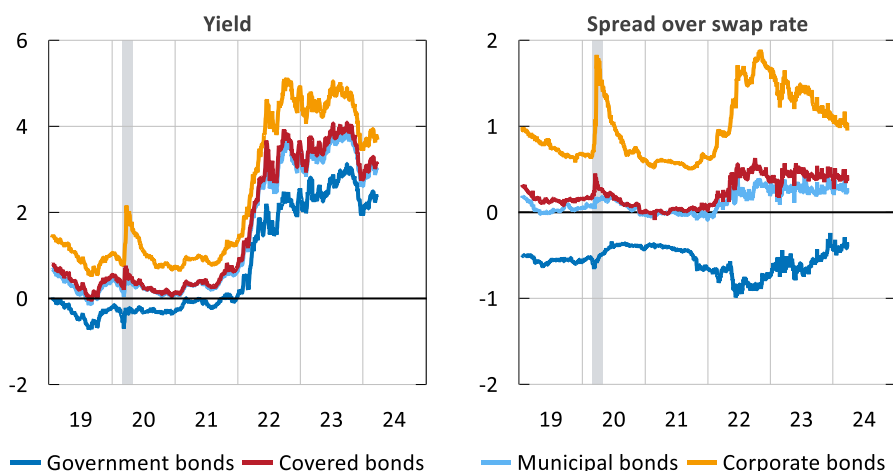
More difficult for Swedish banks and non-financial companies to obtain funding

In March 2020, the turmoil in global financial markets escalated when it became clear that the spread of the coronavirus could not be contained. Investors fled to safer assets, such as government bonds, causing stock markets to fall and risk premia to rise on riskier bonds, such as covered bonds and corporate bonds (see Chart 5, right).¹³ In the tighter funding environment, non-financial companies were particularly affected. For a period no new bonds were issued at all, and the primary corporate bond market stood still, as investors and issuers could not agree on prices.

¹³ The risk premium reflects the difference between investors' expected return on the asset and the risk-free yield. The risk premium affected by factors such as credit risk and liquidity.

Chart 5. Yields on different types of Swedish bonds, 5-year maturity

Per cent (left), percentage points (right)



Note. The chart refers to zero coupon rate calculated using the Nelson-Siegel method. Corporate bonds refer to bonds for companies with credit ratings corresponding to investment grade. Covered bonds refer to covered bonds issued by Stadshypotek and municipal bonds are issued by Kommuninvest.

Sources: Bloomberg, Refinitiv and the Riksbank

The interest rate, and hence companies' funding costs, is indirectly influenced by conditions in the secondary market, where investors trade in existing bonds. When selling pressure increased, especially for corporate bonds, it resulted in price declines due to a lack of buyers.¹⁴ The covered bond market was also negatively affected, with banks periodically finding it difficult to issue such bonds.¹⁵ To some extent, investors also sold long-term government bonds in favour of shorter maturities, but this was not as problematic as in the United States, for example, where problems arose in the government securities market.

The Riksbank took several measures during the coronavirus quarter

During the coronavirus crisis, the Riksbank decided on several measures to keep interest rates low and provide broad support to credit supply, including expanded purchases of debt securities.¹⁶ The majority of these purchases took place after the first quarter of 2020 and are therefore not reported here but in a later section. However, the announcement of the purchases had immediate effects.¹⁷ Purchases of nominal government bonds began immediately in mid-March. Purchases of covered bonds and commercial paper started one to two weeks later and purchases of municipal bonds started at the end of April. In March, the Riksbank's corona-related purchases of government bonds totalled SEK 3 billion and covered bonds SEK 10 billion.

¹⁴ See Wollert (2020) for an in-depth analysis of the corporate bond market during the coronavirus pandemic.

¹⁵ See Sveriges Riksbank (2020a).

¹⁶ Other measures include loans to banks for on-lending to companies and loans to banks in US dollars, see Sveriges Riksbank (2020b).

¹⁷ See Gustafsson (2020).

From now on, I will limit myself to focusing on the transactions of the other investors.

Liquidity-driven sell-offs pressured bond markets

Corporate bond funds invest in relatively illiquid corporate bonds while offering daily redemptions to their unit-holders. As more and more unit-holders suddenly wanted to withdraw their money, funds were forced to sell corporate bonds, adding to the selling pressure while there was a shortage of buyers. Funds initially sold more liquid assets, such as covered bonds, which also negatively affected that market.¹⁸ However, the stress in the covered bond market subsided relatively quickly when the Riksbank announced its purchases of such bonds, and when the funds began buying back more bonds than they sold at the end of the quarter. Nevertheless, problems in the corporate bond market continued.

Banks' trading books were quickly filled

Several major banks acted as so-called market makers by buying bonds with the intention of selling them on and making money on the difference between the bid and ask prices. This eased selling pressure somewhat and allowed the markets to function relatively normally for a time. But banks soon reached the limits of how much they wanted to hold on their balance sheets, especially corporate bonds but also covered bonds and to some extent government bonds.¹⁹ The vast majority of their net purchases—over SEK 100 billion—consisted of covered bonds (see Chart 6).²⁰ I define net purchases here as purchases minus sales and matured bonds. In particular, banks bought each other's covered bonds, but also a small part from their own mortgage companies.²¹

On the left in Chart 7, we see that the major banks increased their holdings of Swedish bonds denominated in SEK during the coronavirus quarter. Their largest net purchases were in government bonds and covered bonds, where they bought back a large part of the government bonds they had previously borrowed and sold (a so-called short position). They more than doubled their holdings of corporate bonds, but this was from a low level relative to their other holdings. On the right-hand side of the same chart, we see that the major banks net sold as many corporate bonds in the secondary market in 2020 after the coronavirus quarter as they bought during the coronavirus quarter. I explain how I isolate secondary market trading in the next section.

¹⁸ See Sveriges Riksbank (2020a). In addition, Swedish fund managers chose to temporarily close trading in some thirty of their funds, which corresponded to fund assets of more than SEK 120 billion, or 2.5 per cent of total Swedish fund assets.

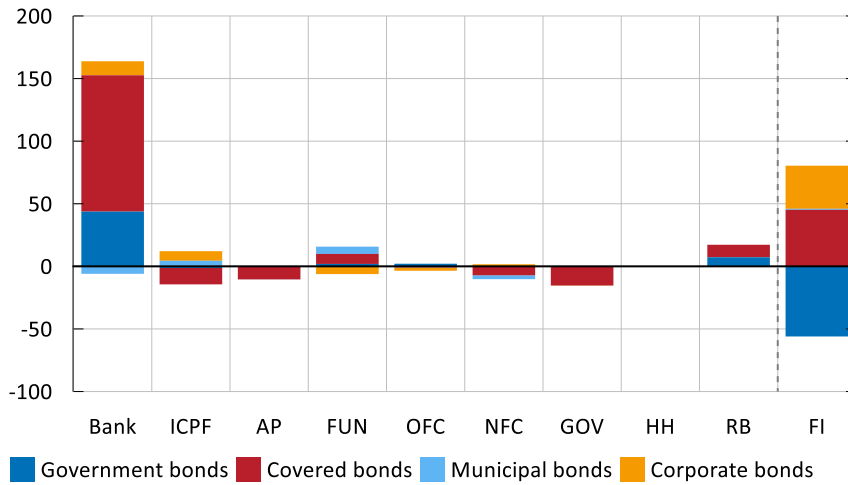
¹⁹ See Gustafsson and von Brömsen (2021) for a detailed description of financial developments in spring and summer 2020.

²⁰ Banks have actual contracts with each other and thus an obligation to act as market makers for each other's covered bonds. Such agreements do not exist in the same way for corporate bonds. In some cases, however, the bank representing the issuer may have undertaken to establish a certain trade in the bond.

²¹ Mortgage companies are often wholly-owned subsidiaries of banks that act as mortgage institutions.

Chart 6. Change in holdings of Swedish bonds, first quarter 2020

SEK billion

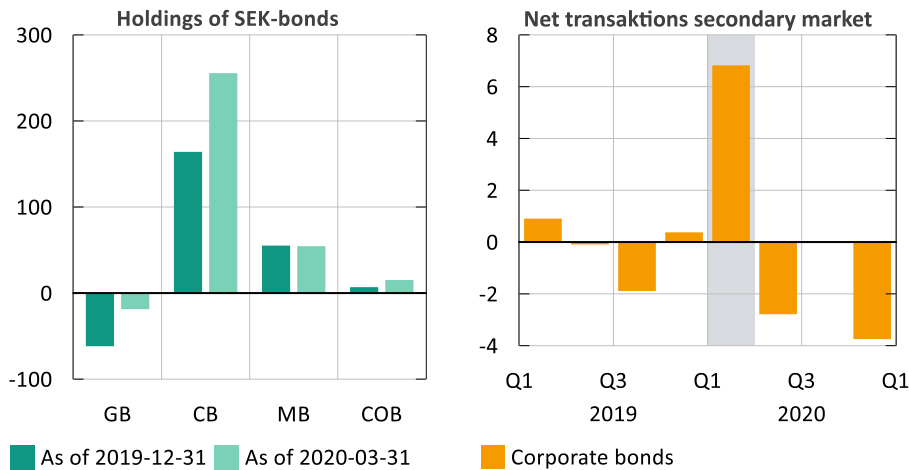


Note. The chart refers to nominal values of holdings in all currencies. Bank refers to monetary financial institutions such as banks and credit market companies, ICPF stands for insurance companies and pension institutions, AP for the national buffer funds, FUN for funds, OFC for other financial companies, NFC for non-financial companies, GOV for general government, HH for households, RB for the Riksbank and FI for foreign investors.

Sources: Statistics Sweden, the Riksbank and author's calculations

Chart 7. Major banks' holdings of Swedish bonds and net transactions in corporate bonds

SEK billion



Note. The chart refers to nominal values of bonds. GB refers to government bonds, CB to covered bonds, MB to municipal bonds, COB to corporate bonds. Negative values in the chart on the left for government bonds mean that the major banks had net sold borrowed bonds with the aim of buying them back in the future. Net transactions are purchases minus sales. The major banks are major Swedish banks and Swedish branches of major Nordic banks that were active in the market during the period. Shaded area indicates the coronavirus quarter Q1 2020.

Sources: Statistics Sweden, the Riksbank and author's calculations

3.2 Investor behaviour analysed with microdata

To isolate trading in the secondary market, which contributed to the financial stress, I use microdata and analyse each transaction for each individual bond.

I divide the bonds into five categories based on the outstanding nominal amount at the beginning and end of the quarter. If a bond was added during the quarter, I assume that investors bought it in the primary market. If the bond no longer exists at the end of the quarter, I assume that it has matured or that the issuer has redeemed it, thus paying back the loan to the investor. If the outstanding nominal amount in local currency remains unchanged, I assume that the trade took place in the secondary market. Some bonds exist both at the beginning and at the end of the quarter, but the outstanding amount has increased or decreased. This occurs when the issuer issues within, or redeems parts of, an existing bond issue. If it is a so-called benchmark bond, it is common for the issuer to buy back parts of the bond in the secondary market, which I report separately for covered bonds.

Swedish corporate bonds

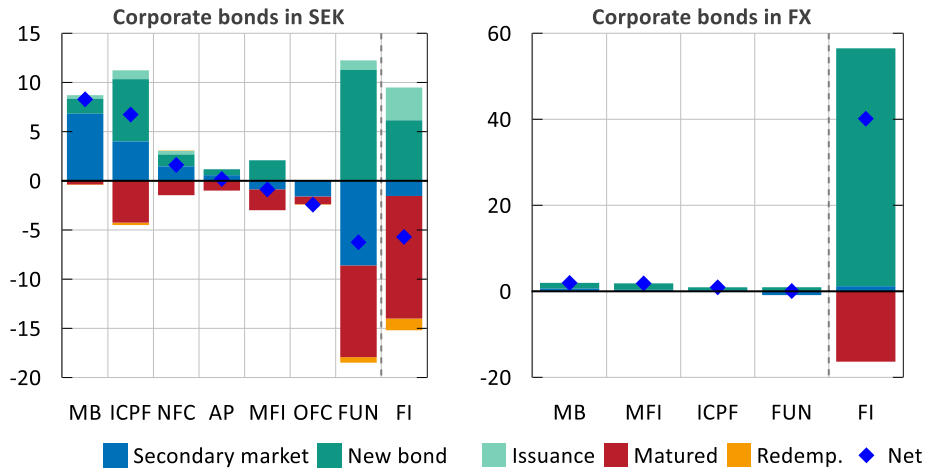
As in the European corporate bond market, the Swedish market lacks regular market makers, which distinguishes it from the Swedish market for government bonds and covered bonds. The relatively small outstanding volumes per bond and the varying credit quality of borrowers make it more difficult to maintain a market-making function in corporate bonds. In many respects, it functions as a so-called buy-and-hold market, where investors typically buy bonds at the time of issuance and hold them to maturity, or take the opportunity to extend their holdings when the time to maturity has become short. The banks that organised the issuance normally undertake to maintain trading in the bond whenever possible. However, larger deals are often brokered directly between buyers and sellers because banks have limited ability to take on the risk of owning the bond themselves.

Funds sold corporate bonds to banks and the insurance and pension sector

The fund sector net sold Swedish corporate bonds in the secondary market for a total of SEK 9.5 billion, of which SEK 8.6 billion was in SEK-denominated bonds (see Chart 8). But at the same time, their holdings only decreased by SEK 6.2 billion. This is because they also bought a significant amount of issuances in the primary market in the same quarter, before the financial turmoil broke out (see Chart 11 below). The funds net sold 263 various bond issues in the secondary market for a net amount of SEK 14 billion, with banks buying 37 per cent of the bonds sold, the insurance and pension sector 28 per cent and foreign investors 18 per cent (see Chart 9). Although the funds were net sellers in the secondary market, they made net purchases of individual bonds totalling SEK 5.3 billion, mainly from foreign investors. This meant that, in net terms, banks and the insurance and pension sector were virtually the only buyers of the funds' bonds.

Chart 8. Net transactions in Swedish corporate bonds, first quarter 2020

SEK billion

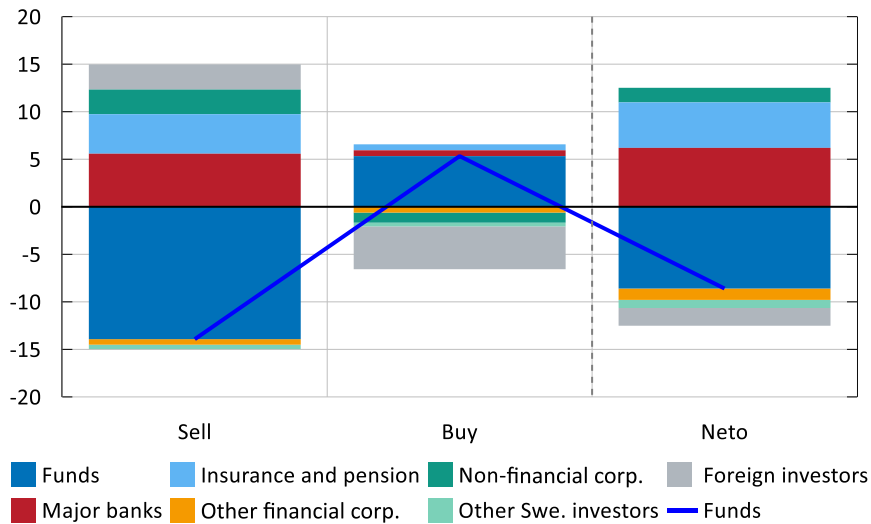


Note. Sample of investor groups. Net transactions are changes in the nominal values of bond holdings. MB refers to major Swedish banks and Swedish branches of major Nordic banks that were active in the market during the period, ICPF stands for insurance companies and pension institutions, NFC for non-financial companies, AP for the national buffer funds, MFI for monetary financial institutions other than major banks, OFC for other financial companies, FUN for funds and FI for foreign Investors.

Sources: Statistics Sweden, the Riksbank and author's calculations

Chart 9. Net transactions in SEK-denominated corporate bonds traded by funds, first quarter 2020

SEK billion



Note. Net transactions are purchases minus sales. "Sell" shows the bonds that funds net sold, and "Buy" the bonds that the funds net bought. "Neto" shows the sum of these two bars. Each bar totals to zero.

Sources: Statistics Sweden, the Riksbank and author's calculations

A significant portion of the bonds could not be traded due to factors such as lack of transparency and liquidity, resulting in large differences between bid and ask prices.²² This resulted in poor market functioning despite the fact that both banks and insurance and pension companies acted as buyers. There were simply more sellers than buyers.

Banks, insurance and pension companies stabilised in various market segments

High-yield corporate bonds were traded to a very limited extent in the secondary market and therefore had little impact on market functioning. In the few transactions that took place, it was mainly funds that sold them to foreign investors (see Chart 10). It should be mentioned that the volume of high yield bonds is relatively small in Sweden.

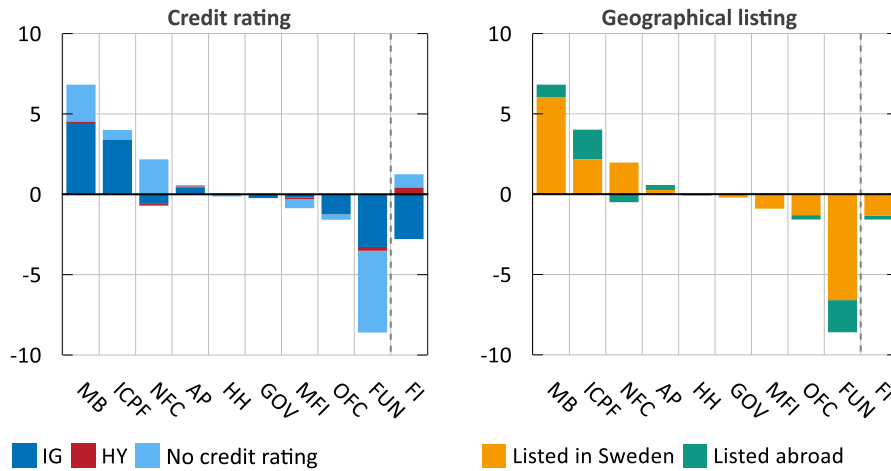
One-third of the bonds purchased by banks and held on their balance sheets were non-rated, while the insurance and pension sector almost exclusively purchased investment grade bonds. Many Swedish companies still lack a credit rating, and around a quarter of the total outstanding volume in the Swedish market does not have a credit rating. This is a high proportion compared to the European market. Non-rated bonds were the most widely sold by funds. Moreover, half of the SEK-denominated bonds purchased by the insurance and pension sector were listed on foreign markets, while banks almost exclusively purchased bonds listed in Sweden. In this way, we can see that the countercyclical behaviour of these investors in different market segments together had a stabilising effect on the market as a whole.

Although the insurance and pension sector was not as active in the secondary market as banks, they were a significant player in the primary market when the recovery started at the end of March 2020 (see Chart 11). About half of its primary market purchases during the coronavirus quarter were made from week 13 onwards.

²² See Wollert (2020).

Chart 10. Net transactions in SEK-denominated corporate bonds, by rating and geographical listing, first quarter 2020

SEK billion

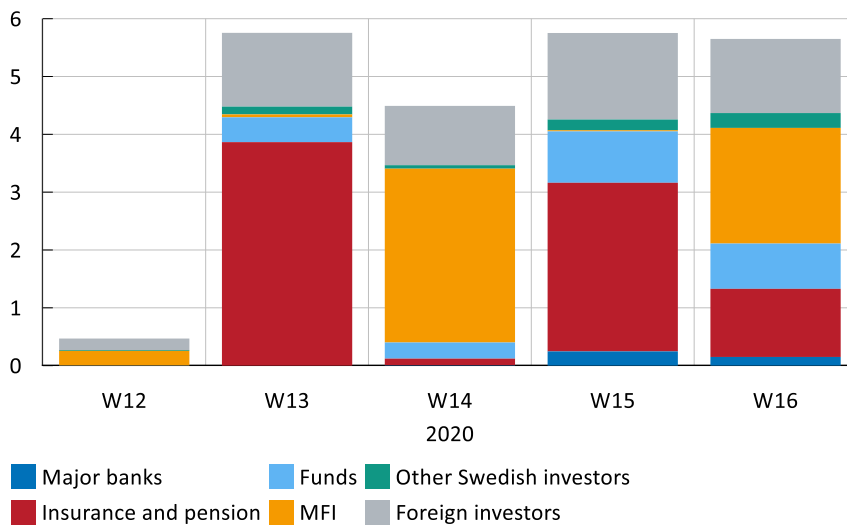


Note. Net transactions are purchases minus sales. Credit ratings are either for the company or for the bond. Issuances where the issuer does not have a rating but where another party acts as guarantor are included under “no credit rating”. IG stands for investment grade and HY for high yield. MB refers to major Swedish banks and Swedish branches of major Nordic banks active in the market during the period, ICPF stands for insurance corporations and pension institutions, NPC for non-financial companies, AP for the national buffer funds, HH for households, GOV for central government, MFI for monetary financial institutions other than large banks, OFC for other financial companies, FUN for funds and FI for foreign investors.

Sources: Statistics Sweden, the Riksbank and author’s calculations

Chart 11. Issued corporate bonds in all currencies broken down by buyers, five weeks starting Mars 16 2020

SEK billion



Note. The chart refers to nominal values of bonds. Insurance and pension includes the national AP funds. MFI are monetary financial institutions that are not major Swedish banks and Swedish branches of major Nordic banks that were active in the market during the period.

Sources: Statistics Sweden, the Riksbank and author’s calculations

The covered bond market

The Swedish covered bond market is characterised by standardised bond loans, known as benchmark bonds, and regular smaller issuances, known as on-tap issuances.²³ In an on-tap issuance, market makers have the opportunity to first buy bonds and then sell them on to investors in the secondary market. It is also common for issuers to buy back parts of a benchmark bond when it is approaching maturity and has less than a year to run, especially when they believe there are favourable prices in the market.²⁴

The frequent on-tap issuances and buybacks make it difficult to distinguish between different types of secondary market transactions. In Chart 12, I use the terms “benchmark (issuance)” and “benchmark (repurchase)” to show the bonds whose outstanding amount increases or decreases during the quarter. However, it is not possible to determine with certainty how much an investor has bought or sold of a particular issue in the market where there have also been issuances or buybacks from the issuer during the period.

Banks mainly bought each other’s issues and later also their own

To support credit supply during the pandemic, the Riksbank eased collateral requirements when banks borrowed money from the Riksbank. Banks were then able to use a larger share of covered bonds as collateral, including those that their own mortgage companies had issued. In total, the banks issued covered SEK-denominated bonds to a value of SEK 139 billion and purchased just over 77 per cent of these, mainly from each other. During the coronavirus quarter, banks bought a smaller amount of their own bonds (see “OB” in Chart 12). However, towards the end of the year, almost 14 percent of their holdings of covered bonds consisted of those that their own mortgage companies had issued (see Chart 13).

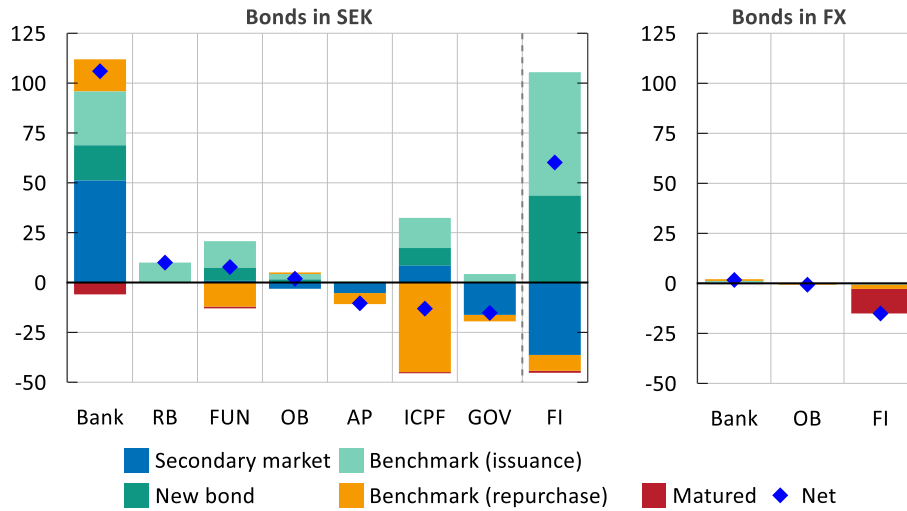
During the coronavirus quarter the banks bought about half of each other’s SEK-denominated bonds in the secondary market, mainly from foreign investors but also from general government actors, including the AP funds. The remaining half consisted of new issuances, either new bond issuances or through on-tap issuances.

²³ See Fager Wettergren, et al. (2013).

²⁴ Investors are then offered to exchange the maturing bond for one with a longer maturity and current interest rate. This is usually done to reduce the risk of not being able to refinance the maturing bond.

Chart 12. Net transactions in covered bonds, first quarter 2020

SEK billion

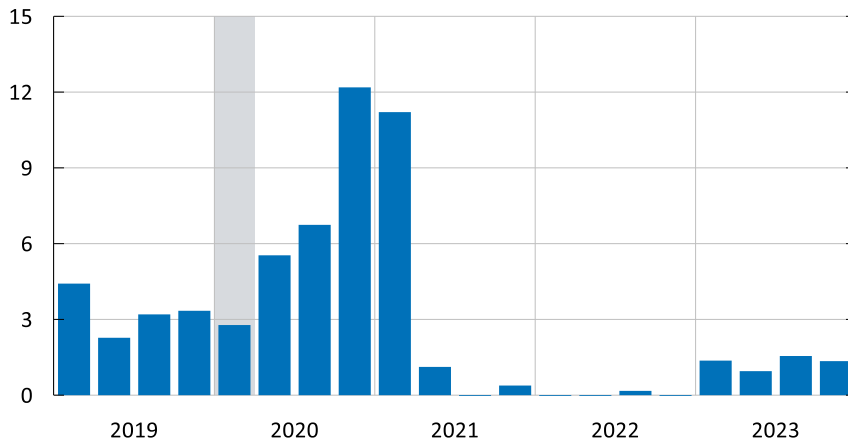


Note. Sample of investor groups. Net transactions are changes in the nominal values of bond holdings. Bank refers to monetary financial institutions such as banks and credit market companies, RB stands for the Riksbank, FUN for funds, OB for banks' holdings of bonds from their own mortgage companies, AP for the national buffer funds, ICPF for insurance companies and pension institutions, GOV for central government and FI for foreign investors.

Sources: Statistics Sweden, the Riksbank and author's calculations

Chart 13. Share of banks' covered bond holdings consisting of bonds from their own mortgage companies

Per cent



Note. Shaded area highlights the period when the Riksbank started to allow banks to use a larger proportion of covered bonds as collateral when borrowing money from the Riksbank, including those that their own mortgage companies had issued. This entered into force on 23 March 2020.

Sources: Statistics Sweden, the Riksbank and author's calculations

Not mainly funds with liquidity problems that sold covered bonds

Yields on banks' covered bonds increased during this period, leading to difficulties in issuing new bonds in some periods. One factor behind this was that the funds, that needed liquidity, sold covered bonds because it was easier than selling corporate bonds.²⁵ Nevertheless, the funds were net buyers of covered bonds during the quarter. They sold back roughly the same amount of benchmark bonds to issuers as they bought bonds from issuers through on-tap issuances. This suggests that they bought back some of their holdings towards the end of the quarter when the most acute uncertainty had subsided. However, I suspect that the amounts for which the funds initially sold were small compared to what the insurance and pension sector sold during the quarter.

²⁵ See Sveriges Riksbank (2020a).

4 Investor behaviour over time

Markets have so far absorbed the Riksbank's quantitative tightening measures and foreign investors are returning to the Swedish bond markets at roughly the same rate as they left during the period of quantitative easing. Some of these foreign investors are funds, and there are indications that they have leveraged part of their holdings of covered bonds. This can make banks' market funding more volatile. For corporate bonds, flow-driven funds may have kept risk premia subdued, contributing to easier funding conditions but also creating vulnerabilities. At the same time, long-term private insurance and pension companies have been countercyclical, mainly buying at elevated risk premia.

In this section, I show which investors have bought the bonds that has replaced the Riksbank's matured holdings and the government bonds sold by the Riksbank. I focus on covered bonds because the Riksbank mainly bought such bonds during the latest bond purchase programme. In addition, I also highlight how prices affect investor behaviour in different ways in the corporate bond market and what vulnerabilities this may create.

4.1 The Riksbank's quantitative easing and tightening affect investor behaviour

When a central bank announces its intention to buy, sell or allow bonds to mature, it affects investor behaviour in several ways. In addition to their expectations of the future policy rate, it may also affect the prices of the specific bonds traded by the central bank, as well as closely related bonds.²⁶ It may also affect the premium that investors require to invest in longer-term bonds or bonds from issuers with lower credit ratings than the government.²⁷ If free float, which I described in an earlier section, decreases for certain maturity segments and some investors are reluctant to switch to other segments, this could lead to investors being crowded out of the market.

Bond markets have been functioning during QT but net issuance has been small

Since mid-2022, the Riksbank has begun quantitative tightening (QT), which means that the Riksbank is reducing its bond holdings by both letting bonds mature and,

²⁶ The findings in Gustafsson (2020) indicate that the Riksbank's purchases during the pandemic contributed to creating more expansionary financial conditions through lower yields, particularly on municipal bonds and covered bonds.

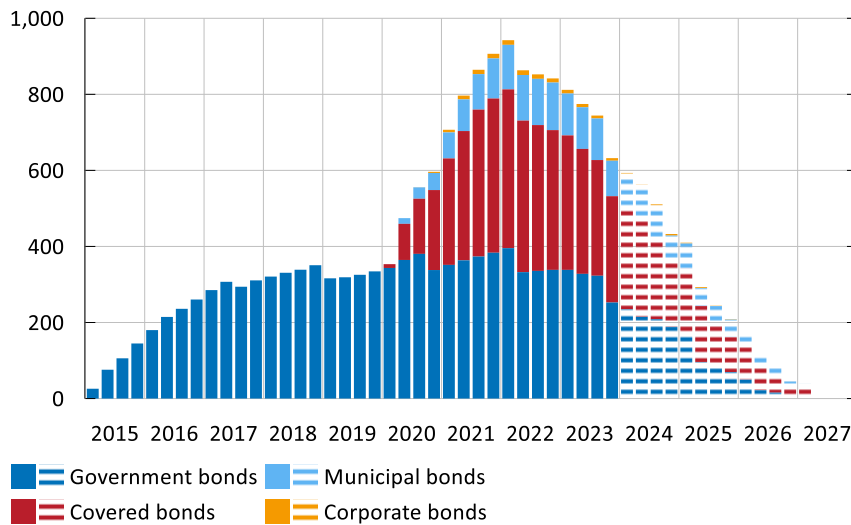
²⁷ The effect on the term premium is mainly relevant for government bonds. Gustafsson and Beechey Österholm (2023) find that the Riksbank's purchases during the pandemic explain a relatively small part of the change in the term premium on Swedish government bonds.

since April 2023, selling government bonds. A projection of the Riksbank’s bond holdings is shown in Chart 14. When the Riksbank sells government bonds, free float increases. It also does so when the bonds owned by the Riksbank approach maturity—provided the issuers need to replace the maturing borrowing by issuing new bonds. Thus, both sales and matured bonds can result in an increased supply of bonds that need to find new investors.

Chart 15 shows which investors have so far taken on this role, with foreign investors accounting for a significant share. During QT, the overall bond issuance in all currencies in these markets has remained relatively unchanged, meaning that the issuers as a group have fully refinanced their matured loans. However, the government’s bond issuance in Swedish kronor has decreased by nearly 90 billion SEK. The fact that the Riksbank’s holdings of government bonds have decreased more than the issuance can be attributed to the Riksbank selling government bonds for approximately 50 billion SEK since April 2023. Regarding covered bonds, the net issuance in SEK has been positive, indicating that banks have refinanced the amounts matured in the Riksbank’s holdings and additionally issued almost 30 billion SEK.

Chart 14. The Riksbank’s bond holdings and projected holdings

SEK billion

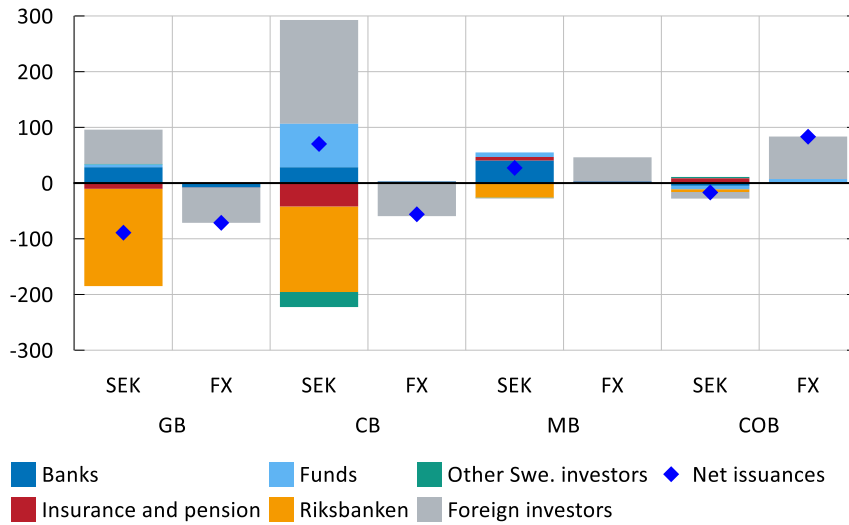


Note. From the Monetary Policy Report in March 2024. The chart refers to nominal values of bonds. The striped bars represent a projection of the Riksbank’s bond holdings. The series in the figure end Q1 2027, which is the final quarter in the Riksbank’s three-year forecast horizon. The Riksbank’s total securities holdings have previously also included treasury bills and commercial paper.

Source: The Riksbank

Chart 15. Net transactions in Swedish bonds so far during QT

SEK billion



Note. GB refers to government bonds, CB to covered bonds, MB to municipal bonds, COB to corporate bonds. Net transactions are the change in nominal values of bond holdings from Q2 2022 to Q4 2023. Banks refer to monetary financial institutions such as banks and credit market organisations. Insurance and pension include the national AP funds.

Sources: Statistics Sweden, the Riksbank and author's calculations

Foreign investors are returning to SEK-denominated bonds

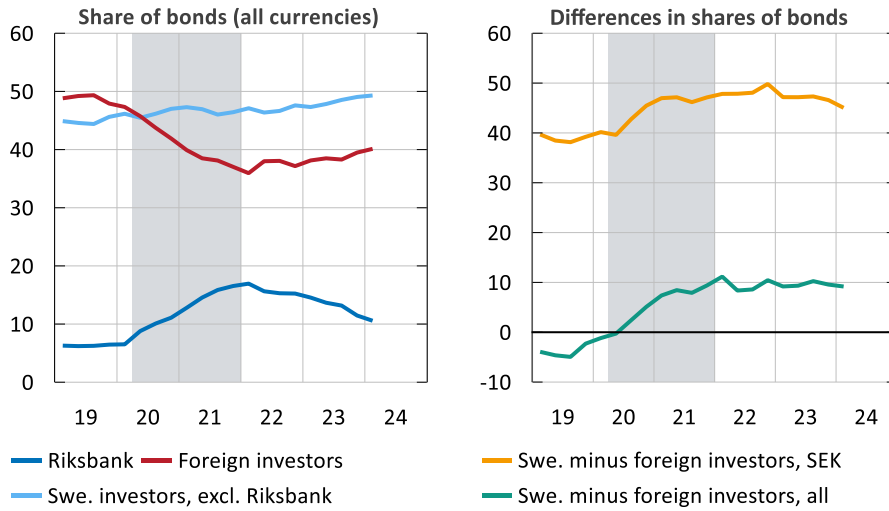
So far during QT, foreign investors have net purchased krona bonds for approximately two-thirds of the amounts that have matured and been sold from the Riksbank's bond holdings (see Chart 15). This is a mirror image of the previous period of quantitative easing (QE) in 2020-2022 when foreign investors sold a significant part of their holdings of Swedish government bonds and covered bonds to the Riksbank, as Österholm (2022) has previously shown. Adjusted for matured bonds, foreign investors are re-turning to SEK-denominated bonds at roughly the same rate as they left them during QE.

In terms of all currencies, the shift between the Riksbank and foreign investors as financiers of Swedish issuers has not been as prominent (see Chart 16). Instead, the shares of the other Swedish investors have increased, while they remained relatively stable during the QE period.²⁸ The explanation for this is that the share of bond borrowing denominated in Swedish kronor increased from 68 to 73 per cent during QE, while it has remained at that level during the QT period so far. Foreign currency bonds are in fact mainly owned by foreign investors. The other two types of investor that have been net buyers of bonds are Swedish banks and funds, with funds showing particularly strong demand for covered bonds.

²⁸ Österholm (2022) finds that foreign investors are more sensitive to the size of the outstanding amount of bonds, especially for government bonds, than Swedish investors are.

Chart 16. Investors' shares of Swedish bonds and differences in shares

Per cent (left), percentage points (right)



Note. The shaded areas refer to the QE period Q1 2020 to Q4 2022. SE stands for Swedish investors.

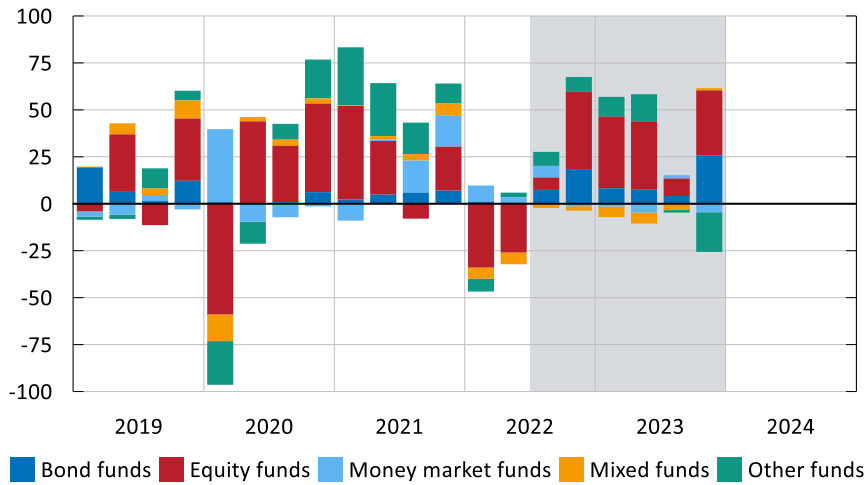
Sources: Statistics Sweden, the Riksbank and author's calculations

Funds with large net inflows have absorbed covered bonds

After foreign investors, Swedish funds have purchased the largest amount of covered bonds during QT (see Chart 15), increasing their holdings by one quarter. They have done so after receiving significant net inflows into Swedish bond funds, which have increased the funds' need to buy bonds (see Chart 17). In the fourth quarter of 2023, we saw the largest quarterly net inflows into bond funds in ten years. How much of the capital inflow the funds in turn want to invest in covered bonds depends, among other things, on how their risk premia develop.

Chart 17. Net flows in Swedish funds by fund type

SEK billion



Note. The chart covers investment funds registered in Sweden under the supervision of Finansinspektionen. Other funds include fund-of-funds (FoF). Shaded area represents QT.

Source: Statistics Sweden

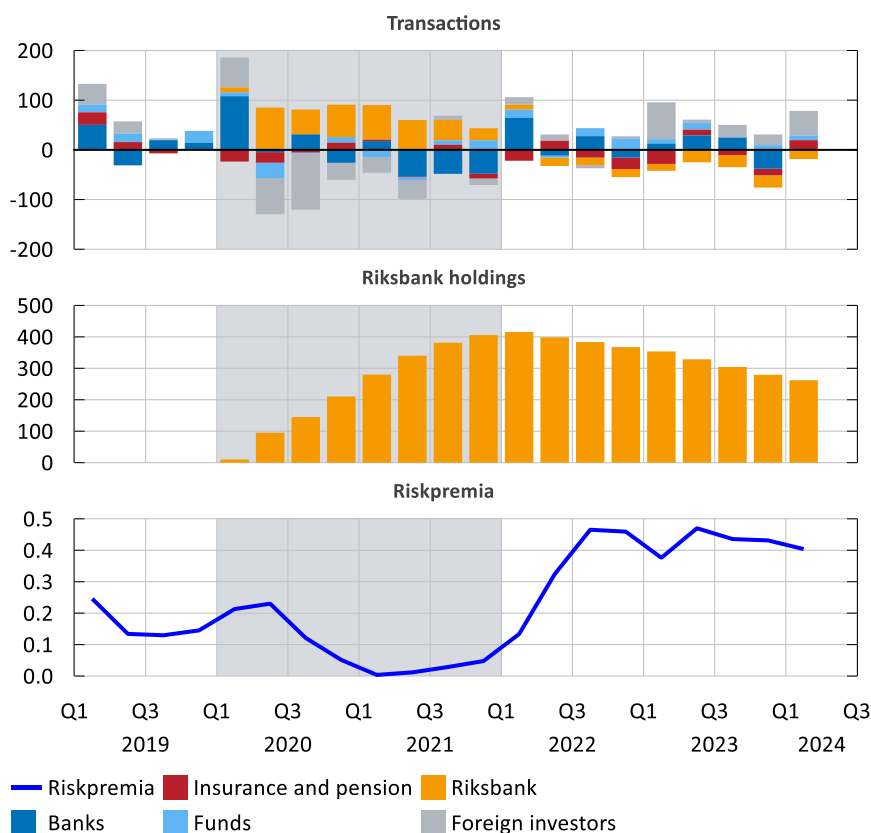
In Chart 18, we see a sharp decline in risk premia for covered bonds after the coronavirus quarter, when the Riksbank started buying them.²⁹ During the QE period, the Riksbank was in principle the only net buyer of covered bonds. After the Riksbank ended its purchases, risk premia rose again and funds started to net purchase covered bonds more consistently. Risk premia thus influence the behaviour of bond funds by determining the risk that the funds take in their portfolios, and to some extent also the extent to which, for example, mixed funds reallocate to bonds.³⁰

²⁹ See also Alsterlind (2021), who shows that the risk premia on covered bonds from all mortgage institutions converged and decreased to close to zero, even on those that the Riksbank did not buy.

³⁰ Mixed funds account for one tenth of total Swedish fund assets. Some of these are called generational funds, where the proportion of equities is gradually reduced in favour of fixed income as investors approach retirement age.

Chart 18. Net transactions in SEK-denominated covered bonds

SEK billion (top two), percentage points (bottom)



Note. Net transactions are changes in the nominal values of bond holdings. The risk premia is the difference between the 5-year zero-coupon covered bond rate and the 5-year swap rate. Interest rates are average daily rates during the quarter. Banks refer to monetary financial institutions such as banks and credit market companies. Insurance and pension include the national AP funds.

Sources: Statistics Sweden, the Riksbank and author's calculations

The insurance and pension sector's demand for covered bonds could increase again due to higher real interest rates

Although risk premia are even higher now than before the pandemic, the insurance and pension sector has been net sellers in the Swedish covered bond market (see Chart 18 above). When market rates were low, the sector increased its share of riskier assets, such as equities and corporate bonds, in an effort to try and better cover its long-term financial guarantees and deliver more returns to its policyholders or pensioners. Although nominal long-term rates have risen markedly in recent years, this trend has not been reversed (see Chart 19, left).³¹ In addition, the share of bonds in foreign currencies in the bond portfolio of insurance and pension companies has

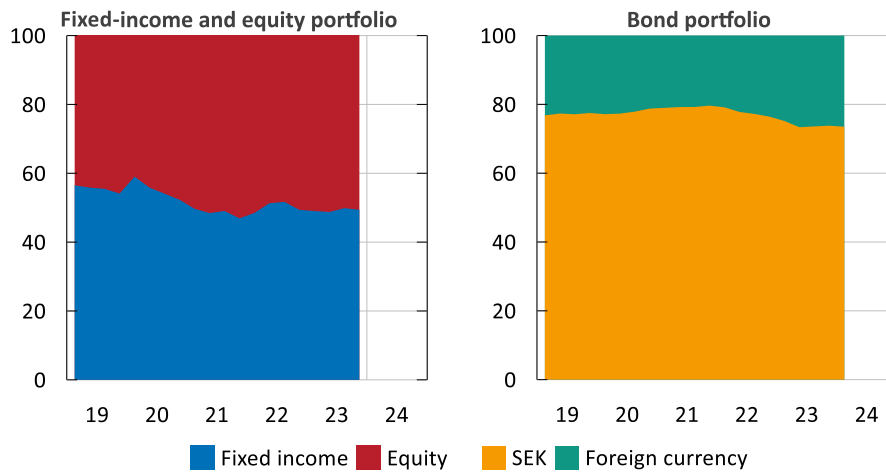
³¹ See Finansinspektionen (2023) for a longer time period. This trend also seems to continue for European counterparts, see EIOPA (2023). It should be noted that they can also increase their exposure to interest rates through interest-rate derivatives. The sector's interest rate swaps increased until mid-2022 and then fell again, see Sveriges Riksbank (2023d).

grown (see Chart 19, right-hand side).³² Some of the guarantees are adjusted upwards with inflation, which may make companies more reluctant to buy bonds until real long-term rates settle at higher levels and thus provide higher inflation-adjusted returns.

By the end of 2023 the real interest rate reached over one per cent, and the sector made net purchases of government bonds for the first time in several quarters (see Chart 20). They also net purchased covered bonds for 20 billion SEK, twice as much as Swedish funds, during the first quarter of 2024 (see Chart 18 above).

Chart 19. Fixed-income and equity portfolio for Swedish insurance and pension companies

Per cent



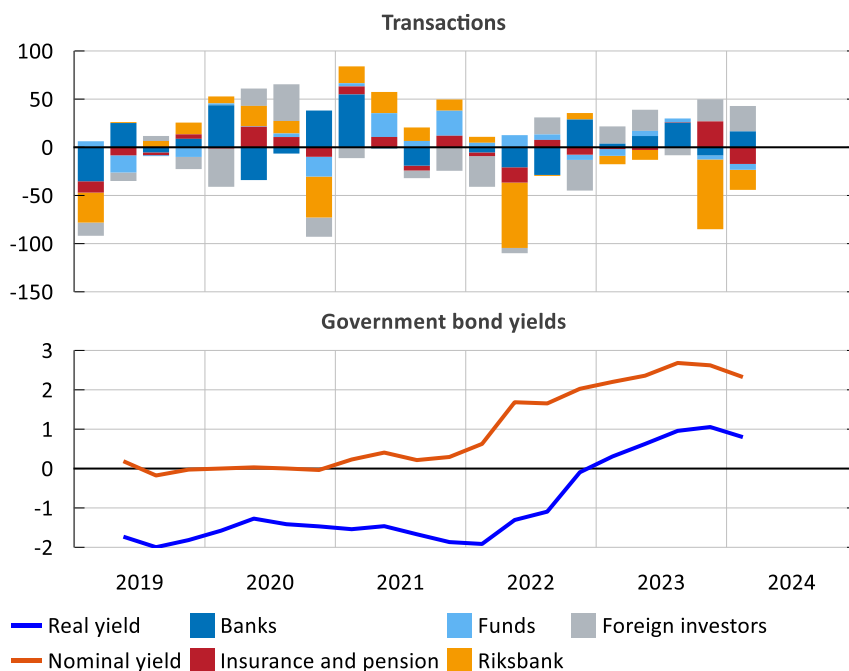
Note. The chart refers to mark-to-market securities. Ten companies that primarily provide custodial insurance, unit-linked insurance or both have been excluded.

Source: The Riksbank

³² It should be noted that since the bonds are marked to market, the depreciation of the krona during the period has increased the value of the foreign bonds when converted into Swedish kronor.

Chart 20. Net transactions in SEK-denominated government bonds

SEK billion (upper), percentage points (lower)



Note. Net transactions are changes in the nominal values of bond holdings. The yields are average daily rates over the quarter and refer to the 5-year zero-coupon rates. Banks refer to monetary financial institutions such as banks and credit market companies. Insurance and pension includes the national AP funds.

Sources: Statistics Sweden, the Riksbank and author's calculations

Foreign funds appear to have leveraged their covered bond holdings

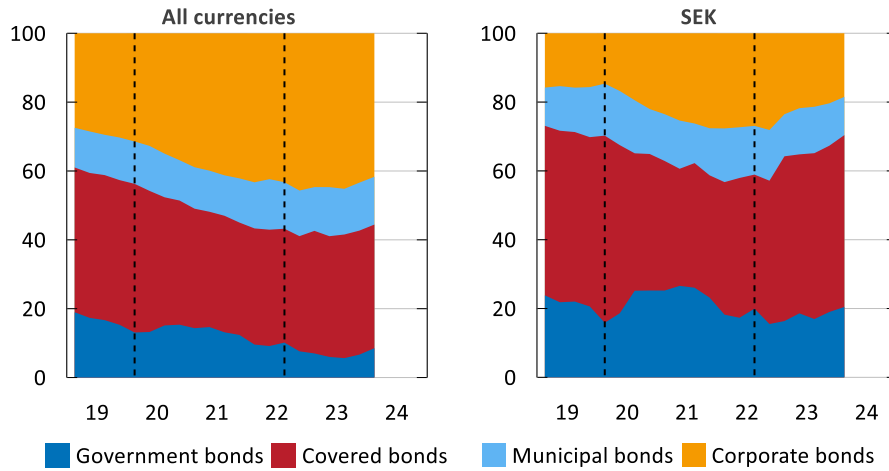
The foreign holdings—calculated as a balancing item of Swedish investors' holdings—actually consist of different types of investors. Indicative data suggest that over time a quarter of them are insurance and pension companies and over a third are funds.³³ Since the Riksbank started QT, foreign investors have reduced their exposure to public-sector bonds in favour of covered bonds and corporate bonds (see Chart 21, on the left). These holdings have historically been more common for foreign funds than for foreign insurance and pension companies, which tend to buy covered bonds in foreign currency. Some of these funds are hedge funds, which often borrow money to finance their holdings through repos. The increase in the turnover of repos, which the Riksbank's monetary policy counterparties conduct with their foreign customers, suggests that foreign investors have financed part of their increased holdings of SEK-denominated covered bonds through loans (see Chart 22).³⁴ Turnover increased rapidly after the risk premium on covered bonds rose sharply in early 2022.

³³ See Österholm (2022) and Myers (2023).

³⁴ A repo is a repurchase agreement whereby one party sells a security to another party for cash and then repurchases it at a predetermined price at a later date.

Chart 21. Foreign investors' portfolio of Swedish bonds

Per cent

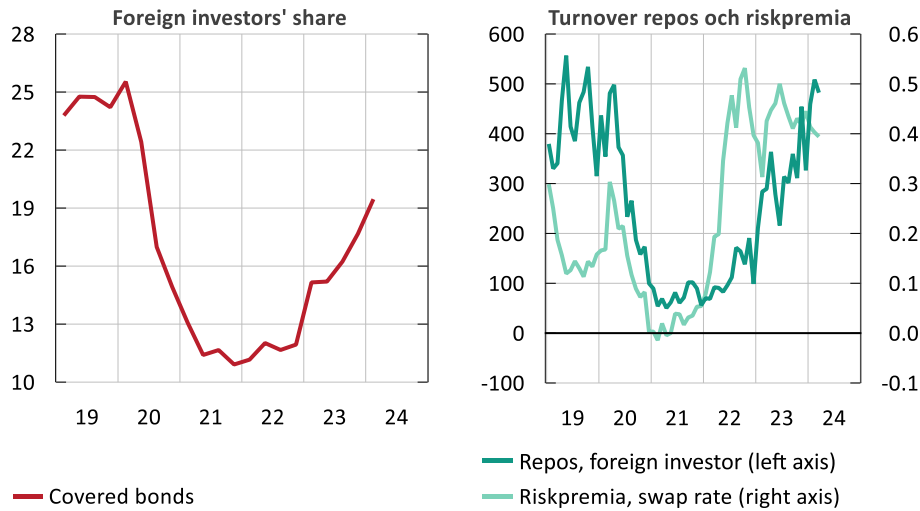


Note. The chart refers to nominal values of bonds. Dashed lines mark the beginning of QE and QT.

Sources: Statistics Sweden, the Riksbank and author's calculations

Chart 22. Foreign investors' market share of SEK-denominated covered bonds, turnover of repos and levels of risk premia

Per cent (left), SEK billion (right, l.a.), percentage points (right, r.a.)



Note. The chart on the left refers to nominal values of bonds. The chart on the right shows the turnover in repos, summarised by month, that the Riksbank's monetary policy counterparties have made with foreign customers. The risk premia is the difference between the 5-year zero-coupon covered bond yield and the 5-year swap rate.

Sources: Statistics Sweden, the Riksbank and author's calculations

4.2 Prices influence investor behaviour in different ways in the corporate bond market

During the coronavirus quarter, vulnerable corporate bond funds contributed to the turbulence in the corporate bond market. To understand how such vulnerabilities build up, it is important to analyse the behaviour of funds over time and to identify investors that act procyclically or countercyclically in the market. This is particularly relevant in the corporate bond market, where difficulties in trading bonds on the secondary market make it especially sensitive to large sell-offs.

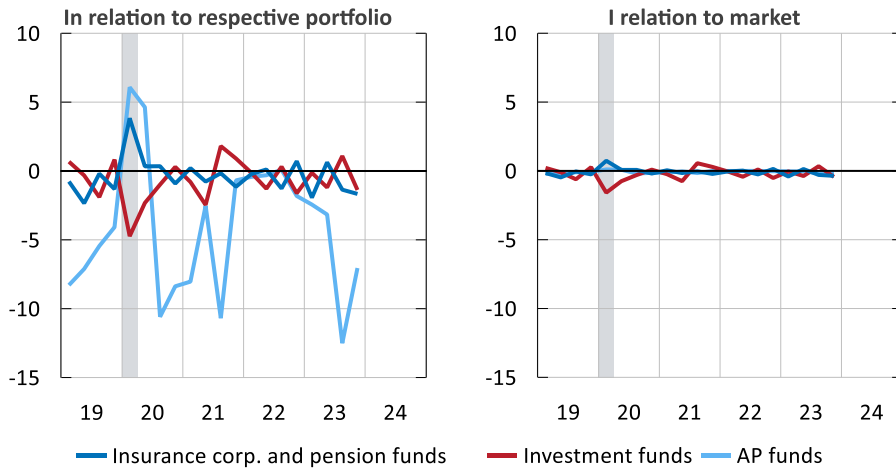
In the absence of market stress, funds are relatively inactive in the secondary market

When the markets are not stressed, Swedish funds do not trade more than other Swedish asset managers in terms of the size of their corporate bond portfolio or the size of the market (see Chart 23).³⁵ At the same time, they continuously buy a high share of the net issues (issuances minus matured bonds) by non-financial companies in the primary market (see Chart 24). This was also true during a period when non-financial companies faced more difficult funding conditions than before, which I have marked with a shaded area in the chart. It is the large and continuous net inflows into the funds that have enabled their net purchases (see A.1 in Chart Appendix). The procyclical behaviour of the funds is therefore mainly linked to large redemptions from the funds. It is worth noting that, with the exception of the AP funds, the insurance and pension sector trades very little in corporate bonds in the secondary market. The AP funds' holdings are small relative to the size of the market and it should be noted that they were net buyers during the coronavirus quarter.

³⁵ Net turnover is net purchases or net sales divided by either the size of the holding in the previous quarter or the value of all outstanding bonds.

Chart 23. Asset managers' net turnover in the corporate bonds market

Per cent of holdings in previous quarter

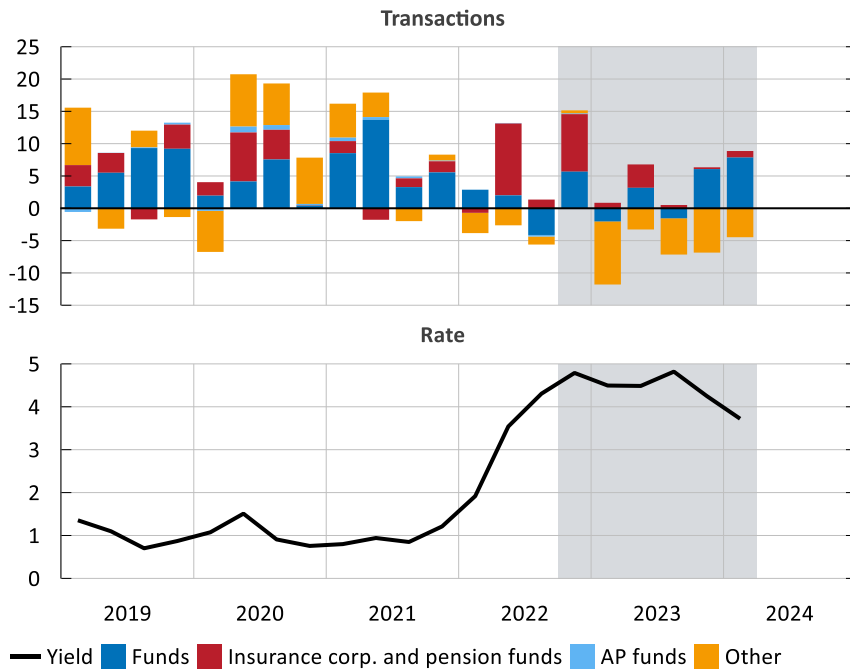


Note. The chart refers to nominal values of bonds. The shaded areas show the period coronavirus quarter Q1 2020.

Sources: Statistics Sweden, the Riksbank and author's calculations

Chart 24. Purchases of issuances minus matured holdings of SEK-denominated corporate bonds

SEK billion (upper), percentage points (lower)



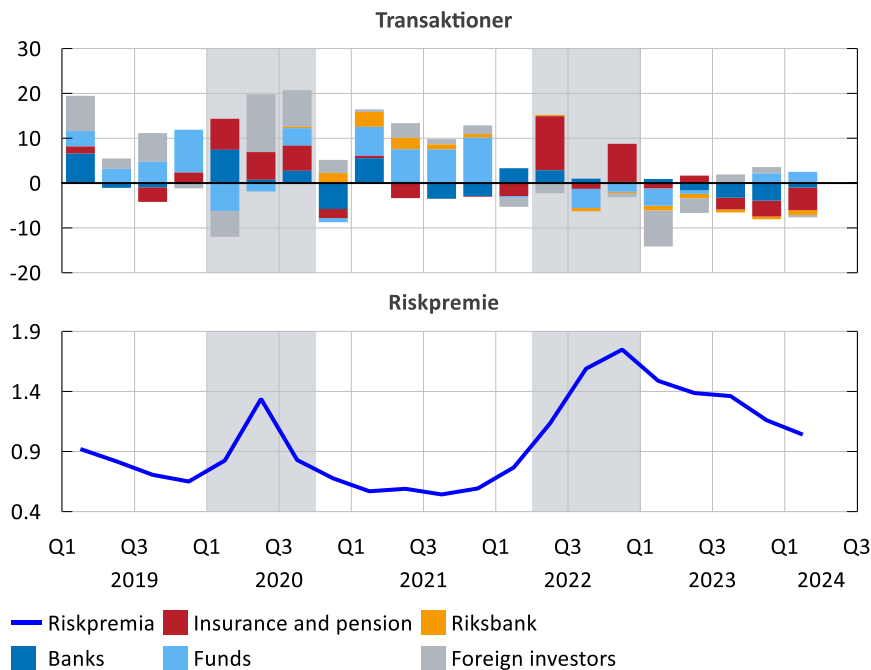
Note. Refers to changes in the nominal values of bond holdings. The interest rate is the average daily interest rate during the quarter and refers to a 5-year zero-coupon rate on investment grade corporate bonds.

Sources: Statistics Sweden, the Riksbank and author's calculations

The insurance and pension sector follows elevated risk premia while funds follow flows

The insurance and pension sector buys bonds in more difficult funding environments when the return is higher. But in the shaded areas of Chart 25, we see that it is more selective in its buying than what funds are. In 2022, when risk premia were higher than during the coronavirus pandemic, insurance and pension companies were almost the only investors to increase their net holdings of corporate bonds. Funds, on the other hand, buy more continuously and act when they have flows, as they have incentives to be fully invested even in periods when risk premia are subdued.³⁶ Instead, insurance and pension companies can choose which assets to allocate to in each situation, allowing them to invest new paid-in premia at a higher expected risk-adjusted return.

Chart 25. Net transactions in SEK-denominated corporate bonds
SEK billion (upper), percentage points (lower)



Note. Net transactions are changes in the nominal values of bond holdings. The risk premium is the difference between a 5-year zero-coupon corporate bond yield with a credit rating equivalent to investment grade and a 5-year swap rate. Interest rates are average daily rates during the quarter. Banks refer to monetary financial institutions such as banks and credit market companies. Insurance and pension include the national AP funds.

Sources: Statistics Sweden, the Riksbank and author’s calculations

The insurance and pension sector has the ability to act long-term in corporate bond market

Insurance and pension companies tend to have large and continuous inflows of net premia from their policyholders or pensioners. Cancelling or transferring insurance

³⁶ It may also be because of other reasons, such as how their investment mandates are established.

contracts takes considerably longer than making redemptions from funds, and the likelihood of liquidity-driven sales is much lower from this perspective. The Riksbank has previously pointed out that higher and more varied risk premia can attract long-term investments.³⁷ The sector has increased its holdings since then, and we can see that they are long-term owners of the bonds they buy. The AP funds, on the other hand, have shown a certain propensity to net sell bonds in the secondary market.

However, the sector may also act short-term in certain situations, mainly linked to their use of derivatives.³⁸ Given that the sector is in a good financial position, it would take a lot before they need to sell illiquid corporate bonds. However, if they have sold more liquid assets such as covered bonds, it may mean that they have a larger share of corporate bonds than usual. This may lead them to sell off assets in the long term to rebalance their portfolios.

³⁷ See Sveriges Riksbank (2023d).

³⁸ See Sveriges Riksbank (2023c).

5 Concluding discussion

In this staff memo, I have highlighted how different market situations since 2020 have affected investor behaviour in Swedish bond markets. I have also demonstrated that investors do not act procyclically or countercyclically in all situations or markets. The insurance and pension sector is a good example of this. They acted countercyclically in corporate bonds during the first quarter of the coronavirus pandemic but procyclically in covered bonds.

For corporate bonds, the allocation decisions of the insurance and pension sector had a supportive effect in market segments where the banks were not as active. However, the selling pressure from funds was too significant. In the aftermath of the crisis, investors in the sector have said that they would have liked to buy more corporate bonds than they did, but that a lack of transparency and insufficient liquidity in the secondary market prevented them from doing so. Additionally, the fact that the sector predominantly purchased bonds with credit ratings underscores the importance of these ratings. Rating more bonds could increase the sector's room for manoeuvre, as insurance and pension companies' internal mandates often determine how much they can invest in non-rated bonds.

The procyclical behavior of the insurance and pension sector in covered bonds can in part be explained by their liquidity management. During the coronavirus quarter, they sold covered bonds to free up capital to buy riskier assets such as corporate bonds and equities. This procyclical behavior was paused during the period when the Riksbank bought covered bonds. When market rates began to rise again, their liquidity needs increased accordingly, primarily due to the increased margin requirements on their derivatives—and they resumed selling.³⁹

The more flow-driven funds have consistently purchased corporate bonds when they have had net inflows, thereby keeping risk premia down to some extent, as the net inflows have been significant. While continuous purchases have been supportive, especially during periods of tighter funding conditions, they can lead to two stability concerns. First, subdued risk premia may make it less attractive for other investors to enter the fray. Funds will then have a larger market share, which means that if financial stress occurs, the impact of liquidity-driven sell-offs will be greater. Second, the dampening of risk premia implies that under stress prices would fall from higher levels. This is something that should be further analysed, especially how it relates to other countries.

So far during the Riksbank's quantitative tightening (QT) measures, funds have played a major role in absorbing the bonds that has replaced the Riksbank's matured holdings. It is clear that demand for bond funds has been strong recently, but their incentives and absorptive capacity will be influenced by, among other things, which fund categories have net inflows in the future. If there are net outflows instead, this would increase the supply of bonds in the market. This may happen if households need to

³⁹ See Riksbank (2023c) for a more detailed description of their increased liquidity needs during rising rates.

redeem fund units, for example, to cope if interest rates remain high and economic activity remains subdued.⁴⁰ On the other hand, higher interest rates, especially real interest rates, would probably significantly increase the insurance and pension sector's demand for bonds. The sector is also historically underweighted in SEK-denominated bonds, which could increase their propensity to buy such bonds. However, it should be borne in mind that the Riksbank is not alone in conducting QT. Consequently, Swedish issuers will compete with both governments and companies that will be issuing new bonds when, for example, the Federal Reserve's (Fed) or the European Central Bank's (ECB) bond holdings nears maturity.

If issuers were to need to borrow more than they currently do, it would further increase the volume of bonds that need to find investors. The Swedish GDP growth has been weak, and the economy is expected to gradually improve. At the same time, the Swedish government is moving towards a budget deficit with relatively low public debt as a starting point. As a result, the Swedish National Debt Office plans to increase its issuance of SEK-denominated government bonds to SEK 171 billion in 2024 and 2025.⁴¹ This can be compared with the QT period to date, which has resulted in a net maturity of SEK 90 billion. Investors who might buy Swedish government bonds also have a supply from countries with higher levels of public debt where concerns about debt levels have already pushed up yields, for example in the United States but also in some of Europe's larger economies. For banks, QT also leads to less liquidity being available in the banking system. To compensate for this, banks may choose to increase their long-term funding, for example by issuing more covered bonds.⁴²

Finally, the market have absorbed the Riksbank's QT so far. There also appear to be incentives for non-banks to buy bonds in the later stages of QT. A significant proportion of these investors are foreign funds. Since there are indications that some of their covered bond holdings are leveraged, it should be noted that this may make the market-based funding of Swedish banks more volatile. Furthermore, as the market shares of foreign investors in the Swedish bond markets reflect the Riksbank's shares to around two-thirds, new SEK-denominated bonds can also have a strengthening effect on the krona, depending on the extent to which these investors FX-hedge their holdings.

⁴⁰ See Finansinspektionen (2023).

⁴¹ See Swedish National Debt Office (2024).

⁴² See Andersson and Kaplan (2024).

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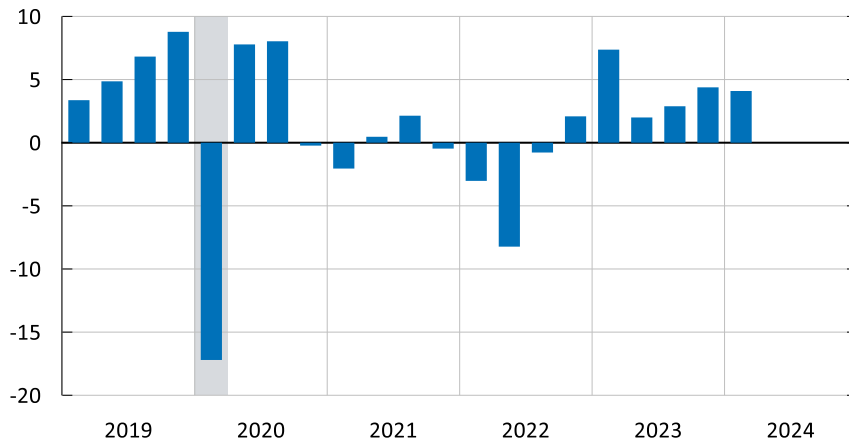
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Chart Appendix

Diagram 1. Quarterly net flows for Swedish corporate bond funds

SEK billion



Note. Net flows are the difference between deposits and redemptions from funds. Shaded area indicates the coronavirus quarter.

Source: Macrobond



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